Space Weather Forecast

Issued on Monday, 28 March 2022 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Declining risk of G1/Minor Storm intervals Days 1 & 2 (28-29 Mar). Chance of Moderate-class flares throughout.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low with several minor Common-class flares. There are currently five sunspot regions on the visible disc. A region near north centre disc has developed significantly recently, and is now showing a magnetically complex setup although with no significant flares as yet. The region near the southeast limb is currently difficult to classify due to its proximity to the limb. The largest region is in the northeast quadrant. A smaller region in the northwest quadrant has shown some slow development through the last 12 hours. There is a much smaller spot (which produced an M1 flare on 25th) near south centre disc which is now small, simple and inactive.
No Earth directed Coronal Mass Ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind indicated the arrival of a coronal hole fast wind. Wind speeds were initially between 400 and 450 km/s, but rose from 27/0500 UTC to vary between 480-550 km/s. The strength of the Interplanetary Magnetic Field has been at weak to moderate levels. The north-south component has varied moderately. Geomagnetic activity was Quiet to Active (Kp 2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Low, with further Common-class flares expected. There is a chance of activity increasing to Moderate levels, with isolated Moderate-class flares. The recent rapid development of one region and a better view of the area on the southeast limb when it's more fully on the disc may cause these probabilities to be revised.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 25th may give a glancing blow at Earth early on Day 1 (28 Mar). Solar wind speeds are currently elevated, due to the fast wind from a coronal hole. They are expected to remain elevated through Day 1 (28 Mar), slowly easing through Day 2 (29 Mar) as the coronal hole effects wane.
Quiet to Active conditions are expected during Days 1 and 2, with G1/Minor Storm intervals possible from the potential CME arrival. Geomagnetic activity is expected to become predominantly Quiet during Day 2 and continue through Day 4 (31 Mar).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background with no solar radiation storms occurring. However, there is a slightly raised risk of a radiation storm due to the recent significant development of the sunspot near north centre disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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